teria or spores not undergoing actual development are totally without action on a solution of the tellurite. The test seems to be especially useful for ensuring sterility in the case of liquids or therapeutic sera destined for hypodermic injection.

The many thermoelectric methods which have been devised during the past few years for the measurement of very high and of very low temperatures have proved themselves of a wide and general utility. But hitherto no instrument of a similar type has been made available for the accurate measurement of temperatures between 0° C. and 200° C. In the *Physical Review* (vol. xxi. p. 65) Mr. A. de Forest Palmer describes a thermojunction consisting of a soft iron wire in conjunction with an "advance" wire containing copper, nickel, and iron, by means of which temperatures within the extremes named may be determined with an error not exceeding 0·04 per cent. Such an instrument is easily calibrated, and in certain circumstances can profitably replace a mercury thermometer of a corresponding degree of accuracy.

Le Radium for September (2^{e} année, No. 9) contains articles on the influence of the connections on the action of vacuum tubes, by M. Charbonneau, on the treatment of cancer with radium, by M. Darier, and a summary of current work connected with radio-activity.

The *Journal of the Royal Sanitary Institute* for October (xxvi., No. 9) contains articles on the administration of the Food and Drugs Act, by Mr. Wellesley Harris, on the waste of infant life, by Dr. Nash, on hygiene in education, by Mr. White Wallis, and notes on common parasites found in bodies of animals used for food, by Mr. King.

We have received "Contributions from the Research Laboratory and Sewage Experimental Station," Massachusetts Institute of Technology, Boston, vol. i., 1905. It contains several valuable papers, *e.g.* the mode of action of the contact filter in sewage purification, by Messrs. Phelps and Farrell, determination of organic nitrogen in sewage by the Kjeldahl process, by Mr. Phelps, a study of the methods in current use for the determination of free and albumenoid ammonia in sewage, by Mr. Phelps, and determination of the number of bacteria in sewage, &c., by Mr. Winslow.

Messrs. F. Vieweg and Son, Brunswick, have published a fourth edition of "Hauptsätze der Differential- und Integral-rechnung," by Prof. R. Fricke.

Mr. W. B. Clive has published a third edition of Dr. G. H. Bailey's "Second Stage Inorganic Chemistry (Theoretical)." This edition has been re-written and enlarged.

The third, revised edition of "Leitfaden für das zoologische Praktikum," by Prof. W. Kükenthal, has been published by Mr. Gustav Fischer, Jena. The second edition of this work was reviewed in Nature of April 24, 1902 (vol. lxv. p. 581).

The first part of a work on "Die ätherischen Öle," by Dr. F. W. Semmler, has just been received from the publishers, Messrs. Veit and Co., Leipzig. It is proposed to issue the work in twelve parts which will make up three volumes, to be completed during next year. The work will be noticed when the whole of the parts have been received.

A third edition of Mr. Tyson Sewell's "Elements of Electrical Engineering" has been published by Messrs. Crosby Lockwood and Son. The book was reviewed in Nature of November 20, 1902 (vol. lxvii. p. 53), and it is only necessary to mention that more examples have been added to the appendix, and that particulars of the "Wright" and other electrolytic meters have been inserted.

A second edition of Mr. J. W. Russell's "Elementary Treatise on Pure Geometry" has been published by the Clarendon Press. The first edition of the book was noticed in our issue of June 1, 1893 (vol. xlviii. p. 101). Besides numerous small improvements throughout, other changes have been made in the revised edition, and among these may be mentioned the re-arrangement of the examples and the omission of redundant ones. Each chapter has been made independent of following chapters; more use has been made of projection in proofs of theorems, and correlative theorems have been proved by reciprocation. An index has been added.

Messrs. Flatters and Garnett, Ltd., Deansgate, Manchester, have sent us a specimen of new storage cabinets made by them for lantern slides. Each drawer of the cabinet will hold 100 slides in five divisions, and is fitted with brass handle and space for movable card label. Single drawers are supplied, and cabinets are made with four, six, twelve, and twenty-four drawers. There are no grooves in the drawers, but the top edges are cut down a little, so that the slides rise above the edges and can readily be lifted out. The cabinets provide a convenient and neat means of storing lantern slides. A despatch box also submitted by Messrs. Flatters and Garnett is fitted at each end with a strip of brass which clasps the cover when the slides are in transit, and can be swung off immediately the slides are required. This box has the usual rubber packing to prevent shock and breakage.

OUR ASTRONOMICAL COLUMN.

Another Large Sun-spot.—Another large group of sun-spots, the fourth or fifth this year to be visible to the protected naked-eye, is now to be seen on the solar disc not very far from the centre. The group, which consists of a large number of separate small nuclei, is, roughly, 100,000 miles across its longest diameter, and was first seen coming round the limb on Saturday, October 14.

M. Bigourdan's Eclipse Results.—M. Bigourdan, who was placed in charge of the Bureau des Longitudes expedition to Sfax (Tunis) to observe the recent total eclipse of the sun, communicated the preliminary results of his observations to a meeting of the Paris Academy of Sciences held on October 2. The greater part of his communication consisted of descriptions of the instruments employed and the conditions they were employed under.

A coronagraph, designed to take numerous large-scale photographs, in order to show the relation between the details of the inner corona and those on the corresponding regions of the solar disc, became deranged after the second plate was exposed, but the two plates obtained show numerous details of the inner corona. In a second coronagraph, of 0·95 m. focal length and 0·15 m. aperture, a green glass screen, transmitting only those wave-lengths near to λ 530, was placed in front of the plate, and the exposure made to last throughout totality. The negative obtained shows the corona extending for about $30'$ from the moon's limb.

Two spectroscopes having slits much longer than the diameter of the solar image were employed, the slits being so arranged that the spectrum of the coronal radiations at points situated at the ends of the sun's axis and equator respectively might be photographed. Photometric observations of the corona, both visual and photographic, were also made.

Observations of the terrestrial magnetic elements showed that the variations caused by the interposition of the moon were but small. The shadow bands formed a very striking

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feature of this eclipse, and were recorded by many observers at Sfax as being sinuous, undulating, and nearly parallel. They travelled at a rate equal to the average walking pace of a man (*Comptes rendus*, No. 14).

ATMOSPHERIC ORIGIN OF "SHADOW BANDS."—In No. 4049 of the *Astronomische Nachrichten* Signor T. Zona, of Palermo, suggests that the shadow bands observed during a total eclipse of the sun are of a purely atmospheric origin. He has observed that the rays of light projected from a man-of-war's searchlight on to a wall several kilometres from the ship exhibit just the same kind of light and dark bands that he observed at Sfax during the recent solar eclipse.

Similarly, he noticed that the light from Venus projected through a small window on to the opposite wall of the room in which he was seated exhibited the same appearance.

Signor Zona suggests that the atmospheric vibrations which cause the agitation seen at the sun's limb, when the latter is observed directly, are the cause of the oscillating bands seen during total eclipses.

A SPECTROGRAPHIC DETERMINATION OF THE SOLAR PARALLAX.—In Nos. 4048–9 of the *Astronomische Nachrichten* Herr F. Küstner describes in detail a method which he has employed to determine the sun's parallax spectrographically, from measurements of sixteen lines on each of eighteen spectrograms of Arcturus, obtained during the period June 24, 1904–January 15, 1905, with the Bonn spectrograph. From these measurements he found the radial velocity of Arcturus relative to the sun to be −4·83 ± 0·27 km. for the epoch 1904·8, and the value for the mean velocity of the earth to be 29·617 ± 0·057 km., the accepted value for the velocity of light *in vacuo* being 299865 ± 26 km. per second.

As the solar parallax previously accepted, viz. 8″·800, is based on the assumption that the earth's velocity is 29·765 km., and as these two quantities vary proportionally, it follows that with a more correct value for the latter a more refined value for the former may be determined.

Having made the determination, Herr Küstner arrives at the quantity 8″·844 ± 0″·017 as his final result for the value of the solar parallax.

NOVA AQUILÆ NO. 2.—The results of several recent observations of the Fleming Nova are published in No. 4049 of the *Astronomische Nachrichten.*

Prof. Wolf, observing on September 17 at 8h. 4·3m. (Konigstühl M.T.), found the Nova's magnitude to be 9·6, showing a decrease of not quite 0·3 mag. since September 4.

Dr. Guthnick, observing at Bothkamp, obtained the photometric results shown in the following table:—

1905	M.T. Berlin	Mag.	1905	M.T. Berlin	Mag.
Sept. 5	8 9h.	10·32	Sept. 14	8·3h.	10·47
,, 8	10·3h.	10·30	,, 19	9·2h.	10·55
,, 12	10·1h.	10·40	,, 22	9·3h.	10·66
,, 13	9 0h.	10·52	,, 23	9·1h.	10·63

The magnitudes are based on those given for the comparison stars in the Harvard photometric revision of the B.D. catalogue.

LIGHT-VARIATION OF SATURN'S SATELLITES.—From observations made on twelve evenings, Dr. P. Guthnick, of Bothkamp Observatory, has determined the phases of the magnitude changes of Tethys, Dione, Rhea, and Titan.

He found that the first named is brightest when at easterly elongation (90°) and faintest at about 330°. Dione reaches its maximum brightness at 90° and its minimum at about 40°. Rhea apparently has two maxima, one at 40°–120° and a fainter one at 240°, the corresponding minima occurring at 180° and 330° respectively. The maximum brightness of Titan occurs at 240°, its minimum brightness at 20°. In regard to Japetus, Dr. Guthnick's observations confirm the results obtained by Prof. Pickering, viz. that the maximum brightness of that satellite occurs at the western, and the minimum at the eastern, elongation. The range of light-variation for each of the satellites Tethys, Dione, and Titan is about 0·75 mag., for Rhea about 1·0 mag., and for Japetus about 1·75 mag. (*Astronomische Nachrichten,* No. 4049).

INTERNATIONAL CONGRESS ON RADIOLOGY AND IONISATION.

THE first international congress for the study of radiology and ionisation, organised under the auspices of the Belgian Government, was held at Liége on September 12–14. The work of the congress was divided into two sections, devoted respectively to physical and biological science. The first section dealt with the following questions:—(1) physics of electrons, comprising also radiations of all kinds; (2) radio-activity and the accompanying transformations; (3) meteorological and astronomical phenomena attributable to ionisation, radio-activity, and to radiations of different kinds. The second section had for its scope the study of the physiological properties of the radiations and their application in medicine.

The opening session of the congress was held in the physics theatre of the University of Liége on September 12 under the presidency of Prof. Kuborn, member of the Royal Belgian Academy of Medicine. Among the members present may be named Profs. Becquerel, Bouchard, and Bergonié, representing the French Republic, Señor J. Muñoz del Castillo, officially representing Spain, Drs. E. F. Nichols and W. Dieffenbach (United States), Prof. Hurmuzescu (Roumania), Prof. Gillon (Italy), Dr. Yankorits (Servia), Lion Sy Thang (China), Dr. Arrago (Guatemala), Dr. Ortiz (Argentine). Prof. Lassar represented the Röntgen Association of Berlin, Prof. Onnen the Royal Society of Batavia, and Mr. Wilton the University of Adelaide, South Australia. The following were also present:—Messrs. Birkeland, Himstedt (Freiburg in B.), Gariel (Paris), and Legge (London).

Sir William Ramsay had intended to present an address on radio-thorium, but in his unavoidable absence it was read on his behalf. M. Becquerel gave a lecture on the analysis of the radiations of radio-active substances. The address will be published in the *Comptes rendus* of the congress, shortly to be issued by the organising committee (general offices, No. 1 Rue de la Prévôté, Brussels).

On September 13 a general meeting was held. Prof. Wind, of Utrecht, presented a communication on the diffraction and wave-length of the *n*-rays, and demonstrated the character of the apparatus designed by his colleague M. Haga and himself for the study of this much controverted question. Prof. Lassar, of Berlin, gave an account of the practical application of the new radiations. M. Tommasina, of Geneva, described a study of the radio-activity produced by atmospheric air (Elster and Geitel's phenomenon), and papers relating to the therapeutic action of the X-rays and of radium were read by Drs. Bergonié (Bordeaux), Dieffenbach (New York), and Kassabian (Philadelphia). The latter's hands, owing to their frequent exposure to the radiations used for therapeutic treatment, have during the past few years undergone characteristic changes.

The following papers of noteworthy interest were presented at later meetings:—Remarks relative to the terminology of ionisation, Prof. de Hemptinne (Louvain); disruptive discharge in gases at high pressures, Prof. Guye (Geneva); the spectroscopic study of radium light, Prof. Himstedt (Freiburg in B.); the kinetic theory of the electron serving as a basis for the electronic theory of radiation, Dr. Tommasina (Geneva); on the radio-active constituents of sediments from Echaillon and Salins-Moutiers, Dr. Blanc (Rome); a new apparatus for determining the radio-activity of spring-waters, Dr. H. Sieveking (Karlsruhe); Moser's radiations, Prof. Piltschikoff (Kharkoff); discharge phenomena caused by X-rays and radium radiations, and the transformation of these rays, Prof. Hurmuzescu; critical observations on the theories of atomic disintegration and chemicophysical dissociation, Prof. Muñoz del Castillo; the method of transmission of excited activity to the kathode, Mr. Makower (Manchester); radio-activity of the lava from Vesuvius (eruption of 1904), Dr. Tommasina; on the change of properties of the chemical elements, Prof. Fabinyi (Kolozsvar, Hungary); (1) the experimental methods of studying the transformations of the X-rays and the secondary rays resulting therefrom, (2) classification and mechanism of the different electric phenomena caused by the X-rays, Prof. Sagnac (Paris); absorption phenomena of radium and polonium

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